

4,4' Methylenedianiline (MDA) in the Construction Industry



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Abstract On August 10, 1992, the Occupational Safety and Health Administration (OSHA) issued a final standard regulating occupational exposure to 4,4' Methylenedianiline (MDA), the result of the agency's first negotiated rulemaking effort. MDA is a light-brown crystalline solid with a faint amino-like odor. It is slightly soluble in water and very soluble in alcohol and benzene. MDA is produced commercially by the condensation of aniline and formaldehyde. Crude MDA (40 to 60 percent) is either a liquid or a hard wax-like substance. Purified MDA (99 percent) is either light yellow crystalline flakes or white granules. Routes of exposure to MDA include skin absorption, inhalation, and ingestion. Short-term (acute) overexposure to MDA produces fever, chills, loss of appetite, vomiting, and/or jaundice. Short-term contact with MDA may irritate the skin, eyes, and mucous membranes and sensitization to MDA also may occur. Long-term (chronic) overexposure may cause cancer as well as damage to the liver, kidneys, blood, and spleen.		
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4,4' Methylenedianiline (MDA) in the Construction Industry



**U.S. Department of Labor
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Introduction

On August 10, 1992, the Occupational Safety and Health Administration (OSHA) issued a final standard regulating occupational exposure to 4,4' Methylenedianiline (MDA), the result of the agency's first negotiated rulemaking effort.

MDA is a light-brown crystalline solid with a faint amino-like odor. It is slightly soluble in water and very soluble in alcohol and benzene. MDA is produced commercially by the condensation of aniline and formaldehyde. Crude MDA (40 to 60 percent) is either a liquid or a hard wax-like substance. Purified MDA (99 percent) is either light yellow crystalline flakes or white granules.

Routes of exposure to MDA include skin absorption, inhalation, and ingestion. Short-term (acute) overexposure to MDA produces fever, chills, loss of appetite, vomiting, and/or jaundice. Short-term contact with MDA may irritate the skin, eyes, and mucous membranes and sensitization to MDA also may occur. Long-term (chronic) overexposure may cause cancer as well as damage to the liver, kidneys, blood, and spleen.

Ninety-eight percent of MDA currently produced is used directly in the manufacture of 4,4' Methylenediphenyl diisocyanate (MDI).¹ The remaining 2 percent of MDA is used as a precursor in the manufacture of plastic fibers, antioxidants, dyestuff

¹ *Federal Register* 57(154):35633, August 10, 1992.

intermediates, corrosion preventatives, and special polymers. Purified MDA is used in defense applications and in manufacturing epoxy resin curing agents, wire coating applications, polyurethane co-reactants, and pigments and dyes.

In the construction industry, MDA is primarily used to coat exterior surfaces, such as concrete structures, pipes, and floors. These surfaces located inside or outside of buildings, usually are coated by spray application. The standard, however, covers both spray and roll-on applications.

The following sections discuss the MDA standard as it pertains to the construction industry. OSHA also has developed a separate booklet that discusses the MDA standard's application to the general and maritime industries.

Scope and Application

The OSHA standard for exposure to MDA in the construction industry is outlined in Title 29 ***Code of Federal Regulations*** Part 1926.60. The standard applies to all construction work in which there is exposure to MDA, including:

- construction, alteration, repair, maintenance, or renovation of structures or portions thereof containing MDA;

- installation of, or finishing of surfaces with products containing MDA;
- MDA spill/emergency clean-up at construction sites; and
- transportation, disposal, storage, or containment of MDA or products containing MDA at construction sites.

Provisions of the Standard

Permissible Exposure Limit

Time-Weighted Average and Short-Term Exposure Limit

No employee may be exposed to MDA above the permissible exposure limit (PEL) of 10 parts per billion (ppb) as an 8-hour time-weighted average (TWA), or above a short-term exposure limit (STEL) of 100 ppb over a 15-minute sampling period.

Action Level

The action level for a concentration of airborne MDA is 5 ppb as an 8-hour TWA. When the action level is reached, an employer must begin compliance activities such as exposure monitoring, medical surveillance, or temporary removal.

Regulated Areas

Regulated areas must be established where airborne concentrations exceed the PEL or can reasonably be expected to exceed the PEL and where employees handle or use non-airborne MDA liquids or mixtures. These areas must be demarcated from the rest of the workplace to minimize the number of persons potentially exposed.

No eating, drinking, smoking, chewing of tobacco or gum, or applying of cosmetics is permitted in regulated areas. Access to regulated areas must be limited to **authorized persons** only, and personal protective equipment and clothing are required to be worn by employees working in these areas.

Decontamination Areas

Decontamination areas, located outside of but as near as practical to the regulated area, also must be established for decontaminating workers, materials, and equipment contaminated with MDA. The decontamination area must include an equipment storage area, wash area, and clean change area.

Communication and Training Requirements

An employer performing work with MDA on multi-employer sites must inform other employers at the site of the nature of the work with MDA and the existence of requirements for regulated areas.

Warning signs must be posted in each regulated area and at all entrances or accessways to regulated areas. These signs must bear the following information:

**DANGER
MDA
MAY CAUSE CANCER
LIVER TOXIN
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED TO BE WORN IN THIS AREA**

The employer must ensure that labels or other appropriate forms of warning are provided for containers of MDA anywhere in the workplace. The labels shall include the following legends:

Labels for containers of **pure MDA** must contain the following information:

**DANGER
CONTAINS MDA
MAY CAUSE
CANCER**

Warning labels for containers of **mixtures containing MDA** must include the following information:

**DANGER
CONTAINS MDA
CONTAINS MATERIALS WHICH MAY CAUSE
CANCER
LIVER TOXIN**

Material safety data sheets for MDA must be made available to employees in accordance with the **OSHA Hazard Communication** standard.²

Initial and annual employee training -- including an explanation of the MDA standard, the medical surveillance program, and the medical removal provisions -- are required as well. All written materials and information relating to employee training must be made available to all affected employees without cost.

Emergency Situations

The employer must develop a written plan for emergency situations for each construction operation. The employer must identify emergency escape routes at each specific construction site before construction operations begin. The plan also must require the use of appropriate protective equipment and clothing for employees and a means to alert and evacuate employees in the case of an emergency.

² Under the provisions of the **Hazard Communication** standard, Title 29 CFR Part 1910.1200, employers must inform employees of the hazards and the identities of workplace chemicals to which they are exposed when working.

Exposure Monitoring

Breathing-zone air samples that are representative of each employee's exposure to airborne MDA over an 8-hour period will determine employee exposure. Determination of employee exposure to the STEL must be made from breathing zone air samples collected over a 15-minute sampling period.

Representative employee exposure will be determined on the basis of one or more samples representing full-shift exposure for each shift for each job class in each work area where MDA exposure can occur. Where the employer can document that exposure levels are equivalent for similar operations in different shifts, the employer only is required to determine representative employee exposure for that operation during one shift.

The MDA standard requires that initial monitoring be performed for employees exposed to MDA unless objective or historical monitoring data prove that exposures are below the action level. (See section on **Recordkeeping** for requirements for monitoring data.) If exposure is at the PEL, monitoring must be repeated every 6 months; if above the PEL, every 3 months; if below the action level, monitoring may be discontinued.

The method of monitoring must be accurate to a confidence level of 95 percent and accurate to within plus or minus 25 percent for airborne concentrations of MDA.

When there is a change in the production process, chemicals present, control equipment, personnel, or work practices, new monitoring is required.

Within 15 working days, the employee must be notified in writing of monitoring results and must be informed of the corrective action the employer is taking to reduce exposures to or below the PEL when the PEL is exceeded. The employer is required to provide the employee or the employee representative(s) an opportunity to observe the measuring or monitoring of employee exposure to MDA.

The employer also must perform routine visual inspections of employee skin for dermal exposure (MDA turns skin yellow) and take appropriate corrective action when there is an indication of exposure. The employer must determine the source of exposure, implement protective measures to correct the hazard, and maintain all records of the corrective action.

MDA operations within a regulated area need not be monitored periodically **if** all employees are wearing supplied-air respirators while working in that regulated area.

Medical Surveillance

A medical surveillance program is required, under the supervision of a licensed physician, without cost, for those employees:

- exposed at or above the action level for more than 30 days per year;
- subject to 15 or more days of dermal exposure;
- exposed in an emergency; and
- who show signs and symptoms of MDA exposure.

Initial medical exams are required before January 7, 1993, or before initial assignment and must include a detailed history, physical exam, lab tests including liver function tests and urinalysis, and any additional tests deemed necessary by the physician. No initial medical exam is required, however, if adequate records show the employee was examined according to the requirements listed above within the 6 months prior to January 7, 1993, or the date of initial assignment.

The employer must conduct annual exams following the initial exam, emergency situations, or when the employee develops signs and symptoms associated with MDA exposure. The examining physician must provide in writing the results of these exams to the employer and employee.

The employer must provide the examining physician(s) with:

- a copy of the MDA standard and its appendices;
- a description of the affected employee's duties related to potential MDA exposure;
- the employer's current actual or representative MDA exposure level;
- a description of the protective equipment or clothing used; and
- information from previous employment-related medical exams.

Multiple Physician Review Mechanism

When the employer selects the initial physician to conduct any medical examination for the employee, the employee has the option of a second medical opinion when the employee -- (1) has signs/symptoms of occupational exposure to MDA; (2) disagrees with the opinion of the examining physician; and/or (3) has questionable job status as a result of the physician's opinion.

It is important to note that the employer must promptly inform the employee of the right to seek a second opinion following an initial examination. The employer may condition his participation in, and payment for, the multiple physician review mechanism upon the employee taking two actions within 15 days after receipt of the first opinion -- (1) informing the employer of the intention to seek a second opinion; and/or (2) initiating steps to make an appointment with a second physician.

If the second set of determinations differ from the initial ones, the employer must ensure the disagreement is resolved between the two physicians. If unable to resolve such a disagreement quickly, the affected employee and employer through their physicians may designate a third physician to review findings and conduct exams, tests, and discussions with the prior physicians.

Medical Removal Provisions

An employer must temporarily remove an employee from work when occupational exposure to MDA is at or above the action level or where dermal exposure to MDA may occur in the following circumstances:

- following an initial exam;
- following periodic exams;
- following an emergency situation;
- when an employee has signs/symptoms indicative of acute MDA exposure; and/or
- when the examining physician determines an employee's abnormal liver function tests are not associated with MDA exposure but may be exacerbated as a result of occupational exposure to MDA.

The employer also must remove the employee each time a final medical determination³ results in a finding or opinion that the employee has detected medical conditions that put him/her at an increased health risk from MDA exposure. The employer must implement special protective measures or establish limitations for the employee when recommended by a final medical determination.

An employee may return to former job status when:

- he/she no longer shows signs or symptoms of MDA exposure;
- the physician so advises; or
- a subsequent medical determination shows the employee no longer has a detected medical condition that poses an increased health risk from MDA exposure.

Limitations or special protective measures also may be discontinued when a subsequent medical determination shows them to be no longer necessary.

The employer must provide an employee up to 6 months of medical removal protection benefits⁴ each time the employee is removed from MDA exposure. The employer, however, may condition medical removal protection benefits on the employee's participation in followup medical surveillance provided. If the removed employee files a worker's compensation claim, the employer must continue to provide medical removal protection benefits pending disposition of the claim.

³ A final medical determination is the outcome of the physician's review mechanism required through the medical surveillance provisions of the standard.

⁴ Medical removal protection benefits include maintaining the employee's earnings, seniority, and other employment rights and benefits as they would be if no removal had occurred.

When an employer voluntarily removes or places limitations on an employee who is exposed to MDA, medical removal protection benefits are still required.

If an employee does not recover within 6 months of removal from MDA exposure, the employer must:

- make a medical exam available to obtain a final medical determination;
- ensure the final medical determination indicates whether the employee can be returned to former job status and, if not, what steps to take to protect the employee's health; and
- continue to provide medical removal protection benefits until the employee is returned to former status or a final medical determination shows that the employee is incapable of ever safely returning to former status.

Methods of Compliance Compliance Program

The employer must establish and implement a written compliance program to reduce employee exposure to the PEL or below by the use of engineering and work practice controls and by the use of respiratory protection. Such plans must be reviewed every 12 months to ensure they reflect the current status of operations.

Control Methods

Engineering and work practice controls are primary methods used to reduce occupational exposure to MDA to levels at or below the PEL. To achieve compliance with the PEL, one or a combination of the following control methods must be used:

- local exhaust ventilation equipped with HEPA⁵ filtered dust collection systems;
- general ventilation systems;
- other engineering controls, such as isolation and enclosure; and
- work practices.

⁵A high-efficiency particulate air (HEPA) filter is at least 99.97 , percent efficient against mono-dispersed particles of 0.3 micrometers or larger.

Where feasible engineering controls and work practices alone are not sufficient to reduce MDA exposure to the PEL or below, respiratory protection also is required. Specifically, for those employees engaged in spray application methods, respiratory protection is **required** in addition to feasible engineering controls and work practices to reduce exposures to or below the PEL.

Employee rotation, however, is **prohibited** as a means to reduce exposure. Compressed air may not be used to remove MDA unless it is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

Respiratory Protection

Employers must provide, at no cost to the employee, and ensure the use of respirators when engineering and work practice controls are being installed; when engineering and work practice controls are not sufficient to reduce exposure to or below the PEL; when engineering controls are not feasible in repair or maintenance and spray application processes; and during emergencies.

Respirators must be selected from among those approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH). (See chart page 16.) Where respiratory protection is required, the employer must develop a respiratory protection program.

Respiratory Protection for MDA

Airborne concentration of MDA or condition of use	Respirator type
a. Less than or equal to 10 x PEL	(1) Half-mask respirator with HEPA ¹ cartridge. ²
b. Less than or equal to 50 x PEL	(1) Full-facepiece respirator with HEPA cartridge ¹ and canister. ²
c. Less than or equal to 1000 x PEL	(1) Full-facepiece powered air-purifying respirator with HEPA ¹ cartridges. ²
d. Greater than 1000 x PEL or unknown concentration	(1) Self-contained breathing apparatus with full facepiece in positive-pressure mode. (2) Full-facepiece positive-pressure demand supplied-air respirator with auxiliary self-contained air supply.
e. Escape	(1) Any full-facepiece air-purifying respirator with HEPA ¹ cartridges ² (2) Any positive-pressure or continuous-flow self-contained breathing apparatus with full facepiece or hood
f. Firefighting	(1) Full-facepiece self-contained breathing apparatus in positive-pressure mode.

Source: *Federal Register* 57(154):35684, August 10, 1992

Note: Respirators assigned for higher environmental conditions may be used at lower concentrations.

¹High-Efficiency Particulate Air (HEPA) filter is one that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers or larger.

²Combination HEPA/organic vapor cartridges shall be used whenever MDA is in liquid form or a process requiring heat is used.

If an employee cannot wear negative-pressure respirators, he/she must be given the option of wearing a positive-pressure respirator or a supplied-air respirator operated in continuous-flow or pressure-demand mode.

Where air-purifying respirators are used, the employer must replace the air-purifying element as needed to maintain effectiveness. Employees who wear respirators are allowed to leave the regulated area to adjust or readjust the facepiece or to wash their faces or respirator facepieces to minimize skin irritation associated with respirator use.

Quantitative or qualitative fit testing must be performed and recorded at the initial fitting and at least annually thereafter for each employee wearing a negative-pressure respirator.

Protective Clothing and Equipment

The employer must provide personal protective equipment and clothing, at no cost to the employee, and ensure their proper use when the employee is subject to dermal exposure to MDA; where liquids containing MDA can be splashed into the eyes; or where airborne concentrations of MDA are in excess of the PEL. Recommended protective clothing and equipment may include, but are not limited to aprons, coveralls, gloves, foot coverings, faceshields, and/or goggles.

Employees must use decontamination areas to remove MDA-contaminated work clothing and equipment at the end of the workshift. Employers also must ensure that during their workshift, employees remove all MDA-contaminated protective clothing or equipment prior to leaving a regulated area.

All protective clothing and equipment must be cleaned, laundered, repaired, or replaced as needed to maintain effectiveness. When rips or tears are detected, the personal protective equipment and clothing must be repaired or replaced immediately.

No MDA-contaminated protective work gear may be removed from a decontamination area except by authorized employees for laundry, maintenance, or disposal. MDA-contaminated items must be placed, stored, and transported in sealed, labeled, and closed containers or impermeable bags. Removal of MDA via blowing, shaking, or any method that allows MDA reentry into the workplace is prohibited. The employer must inform those responsible for laundering or cleaning protective clothing and equipment of the potential harmful effects of MDA exposure.

Hygiene Facilities and Practices

The employer must provide decontamination areas for those employees required to work in regulated areas. In small-scale short-term operations, however, the employer may permit

employees to clean their protective clothing or dispose of it before leaving the regulated area.

Change areas must be equipped with separate storage facilities for personal protective equipment and clothing and street clothing.

The equipment area must be supplied with impermeable labeled bags and containers for the disposal of contaminated protective equipment and clothing. If these bags or containers and their contents are to be removed from the workplace to be cleaned, disposed of, or maintained, they must be labeled and sealed to prevent MDA contact.

When feasible, shower facilities must be provided where the possibility exists of employee exposure to airborne MDA in excess of the PEL.

Where dermal exposure to MDA occurs, the employer must ensure that materials spilled or deposited on the skin are removed as soon as possible.

Whenever food or beverages are consumed at the work site and employees are exposed to MDA, the employer must provide clean lunch areas where MDA levels are below the action level or where no dermal exposure to MDA can occur. Prior to eating, drinking, smoking, or applying cosmetics, employees must wash their hands and faces with soap and water. No one may enter lunch facilities with contaminated protective work clothing or equipment.

Housekeeping

All surfaces must be maintained as free as possible of accumulations of MDA. A regular visual inspection program must be instituted to detect MDA leaks, spills, or discharges. All leaks must be repaired, and liquid or dust spills promptly cleaned. The use of compressed air for cleaning is prohibited, but shoveling or dry sweeping is permissible where HEPA-filtered vacuuming or wet cleaning is not feasible. In any case, contaminated debris -- including waste, scrap, debris, bags, containers, equipment and clothing contaminated with MDA -- must be collected and disposed of in a manner that prevents re-entry of MDA into the workplace.

Recordkeeping

All records must be made available to affected employees or their representative(s), OSHA, and NIOSH upon request in accordance with the ***Access to Employee Exposure and Medical Records*** standard, Title 29 CFR Part 1910.20. If the employer ceases to do business, all records must be transferred to successor employers or, if there is no successor, to NIOSH.

In addition, the MDA standard has specific requirements for keeping records pertaining to objective and historical monitoring data and training.

Objective Data

Under the MDA standard, an accurate record must be maintained of initial monitoring or of the objective data that exempted the operations from initial monitoring requirements. The record must be kept for the duration of reliance on the data and must include at least the following information:

- the product qualifying for exemption;
- the source of the objective data;
- the testing protocol, testing results, and/or analysis of material for release of MDA;
- a description of the exempted operation and how the data support that exemption; and
- other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.

Historical Monitoring Data

The MDA standard also requires that an accurate record be kept of all historical data upon which the employer has relied to demonstrate that a particular job will be below the action level to exempt initial monitoring requirements. The information must reflect the following conditions:

- the data are scientifically sound and are collected using sufficiently accurate and precise methods;

- the processes and work practices used were obtained in essentially the same manner as those that would have been used during the job for which initial monitoring will not be performed;
- the characteristics of the MDA-containing material being handled are the same as those on a job for which initial monitoring will not be performed;
- environmental conditions obtained were the same as those for which initial monitoring will not be performed; and
- other relevant data on the operations, materials, processing, or employee exposures covered by the exemption are substantially similar.

The MDA construction standard allows, however, the employer to maintain historical records through the services of competent organizations, such as a trade association or an employee association.

Exposure Measurements and Medical Surveillance

The employer must keep an accurate record of all measurements taken to monitor employee MDA exposure for at least 30 years. This record must include:

- the date of measurement;
- the operation involving MDA exposure;
- the sampling and analytical methods used and evidence of their accuracy;

- the number, duration, and results of samples taken; a description of the type of respiratory protective devices used; and
- the name, social security number, and exposure of the employees whose exposures are represented through the information.

Similarly, the employer must maintain for at least 30 years an accurate record of each employee subject to medical surveillance, including:

- the name and social security number of the employee;
- the medical exam results, including medical history, test results, and physician's recommendations;
- the examining physician's written opinions;
- any employee medical complaints related to MDA overexposure; and
- a copy of all information provided to the examining physician.

Training Records

The MDA standard requires employers to maintain all employee training records for 1 year beyond the last date of the employee's employment.

Other Sources of OSHA Assistance

Safety and Health Program Management Guidelines

Effective management of worker safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their related costs. To assist employers and employees in developing effective safety and health programs, OSHA published recommended ***Safety and Health Program Management Guidelines*** (January 26, 1989, 54 FR:3908-3916). These voluntary guidelines apply to all places of employment covered by OSHA. The guidelines identify four general elements that are critical to the development of a successful safety and health management program:

- management commitment and employee involvement;
- work site analysis;
- hazard prevention and control; and
- safety and health training.

The guidelines recommend specific actions, under each of these general elements, to achieve an effective safety and health program.

State Programs

The Occupational Safety and Health (OSH) Act of 1970 encourages states to develop and operate their own job safety and health plans. OSHA approves and monitors these plans. There are currently 25 state plan states: 23 of these states administer plans covering both private and public (state and local government) employment; the other 2 states, Connecticut and New York, cover the public sector only.

The 25 states and territories with their own OSHA-approved occupational safety and health plans must adopt standards identical to, or at least as effective as, the federal standards. Until a state standard is promulgated, OSHA will provide interim enforcement assistance, as appropriate, in these states. A listing of states with approved plans appears at the end of this booklet.

Consultation Services

Consultation assistance is available on request to employers who want help in establishing and maintaining a safe and healthful workplace. Largely funded by OSHA, the service is provided at no cost to the employer. Primarily developed for smaller employers with more hazardous operations, the consultation service is delivered by state government agencies or universities employing professional safety consultants and health consultants. Comprehensive assistance includes an appraisal of all mechanical, physical work practices, and environmental hazards of the workplace and all aspects of the employer's present job safety and health program. No penalties are proposed or citations issued for hazards identified by the consultant.

For more information concerning consultation assistance, see the list of consultation projects listed at the end of this publication.

Voluntary Protection Programs (VPP)

Voluntary protection programs and onsite consultation services, when coupled with an effective enforcement program, expand worker protection to help meet the goals of the OSH Act. The three VPPs -- Star, Merit, and Demonstration -- are designed to recognize outstanding achievement by companies that have successfully incorporated safety and health programs into their total management system. They motivate others to achieve excellent safety and health results in the same outstanding way as they establish a cooperative relationship between employers, employees, and OSHA.

For additional information on VPPs and how to apply, contact the OSHA national, regional, or area offices listed at the end of this publication.

Training and Education

OSHA's area offices offer a variety of informational services, such as publications, audiovisual aids, technical advice, and speakers for special engagements. OSHA's Training Institute in Des Plaines, IL, provides basic and advanced courses in safety and health for federal and state compliance officers, state consultants, federal agency personnel, and private sector employers, employees, and their representatives.

OSHA also provides funds to nonprofit organizations, through grants, to conduct workplace training and education in subjects where OSHA believes there is a lack of workplace training. Grants are awarded annually, with a 1-year renewal possible. Grant recipients are expected to contribute 20 percent of the total grant cost.

For more information on grants, training, and education, contact the OSHA Training Institute, Office of Training and Education, 1555 Times Drive, Des Plaines, IL 60018, (708) 297-4810.

For further information on any OSHA program, contact your nearest OSHA regional or area office listed at the end of this publication.

Related Publications

Single free copies of the following publications can be obtained from the OSHA Publications Office, 200 Constitution Avenue, NW, Room N-3101, Washington, DC 20210. Send a self-addressed mailing label with your request.

All About OSHA - OSHA 2056

Chemical Hazard Communication - OSHA 3084

Consultation Services for the Employer - OSHA 3047

4,4' Methyleneedianiline (MDA) for General Industry - OSHA 3135

How to Prepare for Workplace Emergencies - OSHA 3088

OSHA Employee Workplace Rights - OSHA 3021

OSHA Inspections - OSHA 2098

Personal Protective Equipment - OSHA 3077

Respiratory Protection - OSHA 3079

The following publications are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 783-3238. Include GPO Order No. and make checks payable to Superintendent of Documents.

Hazard Communication -- A Compliance Kit (OSHA 3104) (A reference guide to step-by-step requirements for compliance with the OSHA standard.) Order No. 929-022-00000-9; cost \$18.00 domestic; \$22.50 foreign.

Hazard Communication Guidelines for Compliance (OSHA 3111) Order No. 029-016-00127-1; cost \$1.00.

Principal Emergency Response and Preparedness Requirements in OSHA Standards and Guidance for Safety and Health Programs (OSHA 3122) Order No. 029-016-00136-1; cost \$2.50.

States with Approved Plans

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New Mexico Environment
Department
Occupational Health and
Safety Bureau
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2850

COMMISSIONER

New York Department of
Labor
State Office Building
Campus 12 - Room 457
Albany, NY 12240
(518) 457-2741

COMMISSIONER

North Carolina Department of
Labor
4 West Edenton Street
Raleigh, NC 27601
(919) 733-0360

ADMINISTRATOR

Oregon Occupational Safety
and Health Division
Oregon Dept. of Insurance and
Finance, Rm 160
21 Labor and Industries Bldg.
Summer & Chemeketa NE
Salem, OR 97310
(503) 378-3272

SECRETARY

Puerto Rico Department of
Labor and Human Resources
Prudencio Rivera Martinez
Building
505 Munoz Rivera Avenue
Hato Rey, PR 00918
(809) 754-2119

COMMISSIONER

South Carolina Department of
Labor
3600 Forest Drive
P.O. Box 11329
Columbia, SC 29211-1329
(803) 734-9594

COMMISSIONER

Tennessee Department of
Labor
501 Union Building
Suite "A" - 2nd Floor
Nashville, TN 37243-0655
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ADMINISTRATOR

Utah Occupational Safety and
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160 East 300 South
3rd Floor
P.O. Box 146600
Salt Lake City, UT 84110-6600
(801) 530-6880

COMMISSIONER

Vermont Department of Labor
and Industry
120 State Street
Montpelier, VT 05620
(802) 828-2288

COMMISSIONER

Virgin Islands Department of
Labor
2131 Hospital Street
Christiansted
St. Croix, VI 00840-4666
(809) 773-1994

COMMISSIONER

Virginia Department of Labor
and Industry
Powers-Taylor Building
13 South 13th Street
Richmond, VA 23219
(804) 786-2376

DIRECTOR

Washington Department of
Labor and Industries
General Administration
Building
P.O. Box 44001
Olympia, WA 98504-4001
(206) 753-6307

DIRECTOR

Department of Employment
Division of Employment Affairs
Occupational Safety and
Health Administration
Herschler Building,
2nd Floor East
122 West 25th Street
Cheyenne, WY 82002
(307) 777-7672

OSHA Consultation Project Directory

State	Telephone
Alabama	(205) 348-3033
Alaska	(907) 264-2599
Arizona	(602) 542-5795
Arkansas	(501) 682-4522
California	(415) 703-4441
Colorado	(303) 491-6151
Connecticut	(203) 566-4550
Delaware	(302) 577-3908
District of Columbia	(202) 576-6339
Florida	(904) 488-3044
Georgia	(404) 894-8274
Guam	(671) 646-9244
Hawaii	(808) 548-4155
Idaho	(208) 385-3283
Illinois	(312) 814-2337
Indiana	(317) 232-2688
Iowa	(515) 281-5352
Kansas	(913) 296-4386
Kentucky	(502) 564-6895
Louisiana	(504) 342-9601
Maine	(207) 289-6460
Maryland	(301) 333-4218
Massachusetts	(617) 727-3463
Michigan	(517) 335-8250(H) (517) 322-1809(S)
Minnesota	(612) 297-2393
Mississippi	(601) 987-3981

Missouri	(314) 751-3403
Montana	(406) 444-6401
Nebraska	(402) 471-4717
Nevada	(702) 486-5016
New Hampshire	(603) 271-2024
New Jersey	(609) 292-7036
New Mexico	(505) 827-2885
New York	(518) 457-2481
North Carolina	(919) 733-3949
North Dakota	(701) 221-5188
Ohio	(614) 644-2631
Oklahoma	(405) 528-1500
Oregon	(503) 378-3272
Pennsylvania	(412) 357-2561
Puerto Rico	(809) 754-2171
Rhode Island	(401) 277-2438
South Carolina	(803) 734-9599
South Dakota	(605) 688-4101
Tennessee	(615) 741-7036
Texas	(512) 440-3834
Utah	(801) 530-6868
Vermont	(802) 828-2765
Virginia	(804) 786-6613
Virgin Islands	(809) 772-1315
Washington	(206) 586-0963
West Virginia	(304) 348-7890
Wisconsin	(608) 266-9383(<i>H</i>)
	(414) 521-5063(<i>S</i>)
Wyoming	(307) 777-7786

H - Health S - Safety

OSHA Area Offices

Area	Telephone
Albany, NY	(518) 464-6742
Albuquerque, NM	(505) 766-3411
Allentown, PA	(215) 776-0592
Anchorage, AK	(907) 271-5152
Appleton, WI	(414) 734-4521
Augusta, ME	(207) 622-8417
Austin, TX	(512) 482-5783
Avenel, NJ	(908) 750-3270
Baltimore, MD	(410) 962-2840
Baton Rouge, LA	(504) 389-0474
Bayside, NY	(718) 279-9060
Bellevue, WA	(206) 553-7520
Billings, MT	(406) 657-6649
Birmingham, AL	(205) 731-1534
Bismarck, ND	(701) 250-4521
Boise, ID	(208) 334-1867
Bowmansville, NY	(716) 684-3891
Braintree, MA	(617) 565-6924
Bridgeport, CT	(203) 579-5579
Calumet City, IL	(708) 891-3800
Carson City, NV	(702) 885-6963
Charleston, WV	(304) 347-5937
Cincinnati, OH	(513) 841-4132
Cleveland, OH	(216) 522-3818
Columbia, SC	(803) 765-5904
Columbus, OH	(614) 469-5582
Concord, NH	(603) 225-1629

Corpus Christi, TX	(512) 888-3257
Dallas, TX	(214) 320-2400
Denver, CO	(303) 844-5285
Des Plaines, IL	(708) 803-4500
Des Moines, IA	(515) 284-4794
Englewood, CO	(303) 843-4500
Erie, PA	(814) 833-5758
Fort Lauderdale, FL	(305) 424-0242
Fort Worth, TX	(817) 885-7025
Frankfort, KY	(502) 227-7024
Harrisburg, PA	(717) 782-3902
Hartford, CT	(203) 240-3152
Hasbrouck Heights, NJ	(201) 288-1700
Hato Rey, PR	(809) 766-5457
Honolulu, HI	(808) 541-2685
Houston, TX	(713) 286-0583
Houston, TX	(713) 591-2438
Indianapolis, IN	(317) 226-7290
Jackson, MS	(601) 965-4606
Jacksonville, FL	(904) 232-2895
Kansas City, MO	(816) 483-9531
Lansing, MI	(517) 377-1892
Little Rock, AR	(501) 324-6291
Lubbock, TX	(806) 743-7681
Madison, WI	(608) 264-5388
Marlton, NJ	(609) 757-5181
Methuen, MA	(617) 565-8110
Milwaukee, WI	(414) 297-3315
Minneapolis, MN	(612) 348-1994
Mobile, AL	(205) 441-6131
Nashville, TN	(615) 781-5423

New York, NY	(212) 264-9840
Norfolk, VA	(804) 441-3820
North Aurora, IL	(708) 896-8700
Oklahoma City, OK	(405) 231-5351
Omaha, NE	(402) 221-3182
Parsippany, NJ	(201) 263-1003
Peoria, IL	(309) 671-7033
Philadelphia, PA	(215) 597-4955
Phoenix, AZ	(602) 640-2007
Pittsburgh, PA	(412) 644-2903
Portland, OR	(503) 326-2251
Providence, RI	(401) 528-4669
Raleigh, NC	(919) 856-4770
Salt Lake City, UT	(801) 486-8405
San Francisco, CA	(415) 744-7120
Savannah, GA	(912) 652-4393
Smyrna, GA	(404) 984-8700
Springfield, MA	(413) 785-0123
St. Louis, MO	(314) 425-4249
Syracuse, NY	(315) 451-0808
Tampa, FL	(813) 626-1177
Tarrytown, NY	(914) 682-6153
Toledo, OH	(419) 259-7542
Tucker, GA	(404) 493-6644
Westbury, NY	(516) 334-3344
Wichita, KS	(316) 269-6644
Wilkes-Barre, PA	(717) 826-6538

U.S. Department of Labor Occupational Safety and Health Administration Regional Offices

Region I

(CT,* MA, ME, NH, RI, VT*)
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Region II

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Region IV

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Region V

(IL, IN,* MI,* MN,* OH, WI)
230 South Dearborn Street
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Chicago, IL 60604
Telephone: (312) 353-2220

Region VI

(AR, LA, NM,* OK, TX)
525 Griffin Street
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Region VII

(IA,* KS, MO, NE)
911 Walnut Street, Room 406
Kansas City, MO 64106
Telephone: (816) 426-5861

Region VIII

(CO, MT, ND, SD, UT,* WY*)
Federal Building, Room 1576
1961 Stout Street
Denver, CO 80294
Telephone: (303) 844-3061

Region IX

(American Samoa, AZ,* CA,* Guam, HI,* NV,* Trust Territories of the Pacific)
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1111 Third Avenue
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*These states and territories operate their own OSHA-approved job safety and health programs (Connecticut and New York plans cover public employees only). States with approved programs must have a standard that is identical to, or at least as effective as, the federal standard.